REMARKS

Claims 1- 19 remain pending in this application with claim 1 being amended by this response.

Objection to Claims 1-19

Claims 1-19 have been objected to under 37 CFR § 1.75 (a) and (d)(1) for failing to particularly point out and distinctly claim the subject matter of the invention. Claim 1 has been amended for purposes of clarity to remove the terms mentioned by the Examiner and return claim 1 to its originally filed scope. Thus, it is respectfully submitted that this objection is satisfied and should be withdrawn.

Rejection of Claims 1-6 under 35 U.S.C. 102 (b)

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by "Hybrid Image Segmentation Using Watersheds and Fast Region Merging" by Haris.

The present claimed invention provides a method for fragmenting (F) images (14i) into homogeneous regions (Ri). The fragmentation (F) uses iterative merges of fragments Fi and Fj which are as similar as possible according to at least one selection parameter. The similarity is evaluated by a product A*B of two factors A and B, A being consistent with a number of pixels and B being consistent with the selection parameter(s). A merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels.

Haris neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels" as in the present claimed invention. Haris describes a multidimensional image segmentation algorithm which combines edge and region-based techniques through the morphological algorithm of watersheds. Haris utilizes an edge-preserving statistical noise reduction approach as a pre-processing stage in order to compute an accurate estimate of the image gradient. Haris discloses the value of pixels of the two fragments considered for the merging. Equation 12 on page 1689 of Harris is a function of the set of pixels of RM_i and RM_j, but not of the other partitions of RM_k and consequently do not produce a mean value.

The present claimed invention, however, weighs (divides) the parameters A*B by the mean number of pixels by fragment (1/C) to get a decision parameter (A*B*C) for merging. The weight (1/C) corresponds to a mean number of pixels per fragment. The size of the fragments considered for the merging is taken into account relative to a mean size. The mean size includes the size of all the fragments within the image. The advantage of accounting for all the fragments within the image is to promote the merging of relatively small fragments – fragments that are small relative to the mean size of all fragments. As disclosed on page 14, lines 21-26, the segmentation of the image is variable, and "by using the term $2/N_m$, which is independent of the fragments considered in the merge, the merging of small fragments is encouraged." N_m is not dependent upon the fragments considered for the merge. Consequently, a homogeneous expansion in size of the fragments is favored during the merging or iterations.

As described above, Haris is concerned with a function of the set of pixels of RM_i and RM_j, but not of the other partitions of RM_k and consequently do not produce a mean value. The present claimed invention, however, weighs (divides) the parameters A*B by the mean number of pixels by fragment (1/C), to get a decision parameter (A*B*C) for merging. Thus, it is clear that Haris neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection

parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels" as in the present claimed invention.

As Claims 2-6 are dependant on Claim 1, it is respectfully submitted that these claims are allowable for the same reasons as independent claim 1. In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Haris showing the above discussed features. It is thus further respectfully submitted that claims 1-6 are not anticipated by Haris. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claim 7 under 35 U.S.C. 103(a)

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haris in view of Moed.

Moed, similarly to Haris, neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels" as in the present claimed invention. Moed describes a system and method for extracting image information from a video frame for regions of the video frame that likely are objects of interest in a scene. An initial region set is generated by comparing luminance image information and color image information of a background image for the scene. A high confidence region set is generated comprising regions from the initial based upon edge information of the regions and edge information in the background image. A final region set is generated by combining one or more regions in the high confidence region set if such combinations satisfy predetermined criteria, including size, region, proximity and morphological region dilation. Moed was cited to disclose an image segmentation

system that operates on a color image. However, as discussed above, Moed, similarly to Haris, neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels," as cited in claim 1 of the present invention. As claim 7 is dependent on independent claim 1 it is respectfully submitted that claim 7 is allowable for the same reasons as claim 1.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Haris and Moed, when taken alone or in combination showing the above discussed features. It is thus further respectfully submitted that claim 7 are not anticipated by Haris or Moed when taken alone or in combination. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claims 8 and 19 under 35 U.S.C. 103(a)

Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schutz in view of Haris.

Schutz, similarly to Haris, neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels" as in the present claimed invention. Schutz describes a method for merging regions for joint motion estimation and segmentation of digital video sequences. The region merging criterion is based on the measure of the matching error for a region when applying a previously estimated motion to it. A region adjacency graphs is used for data representation, which allows a scan independent processing and gives a high-level view. Schutz was cited to disclose a method of

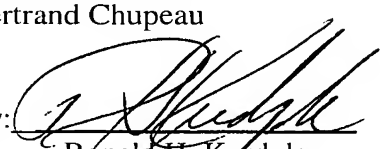
grouping fragments of an image characterized in that the grouping uses a model of motion individual of each fragment Fi. However, as discussed above, Schutz, similarly to Haris and Moed, neither discloses nor suggests "A being consistent with a number of pixels and B being consistent with the selection parameter(s), characterized in that a merge is performed when the product A*B*C is less than a threshold consistent with the selection parameter, C being a factor consistent with the inverse of a mean number of pixels," as cited in claim 1 of the present invention. As claims 8 and 19 are dependent on claim 1, it is respectfully submitted that claims 8 and 19 are allowable for the same reasons as claim 1.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Haris and Schutz, when taken alone or in combination showing the above discussed features. It is thus further respectfully submitted that claims 8 and 19 are not anticipated by Haris or Schutz, when taken alone or in combination. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

The applicant respectfully submits, in view of the above arguments, that the all arguments made by the Examiner have been addressed and this rejection should be withdrawn. Therefore, the applicant respectfully submits that the present claimed invention is patentable.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,
Bertrand Chupeau

By: 

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